

Please bring up to me:

-Pg.95 Questions #1-4

-Pg. 98-99 Activity 3.2 #1-3

-Pg. 102 #5,6

3.2

Simple and Compound Interest

When you deposit money into a savings or investment account, you earn interest from your financial institution because you are lending them your money. When you borrow money, you must pay interest to the financial institution. The interest you pay is compensation to the lender for the use of their money.

Simple interest is based on the original amount, or **principal**, invested or borrowed. Interest is usually stated as a certain percentage per annum (per year). Simple interest is often used for personal loans and short-term investments. The time in years for the investment or loan is called the **term** of the investment.

If you keep the interest earned in your account, new interest may be paid on the principal plus that interest. This is called **compound interest**. Compound interest can be paid more than once a year. The interest rate is stated per annum and is divided by the number of **compounding periods** per year. For example, if the interest rate is compounded:

- semi-annually (twice a year), divide the interest rate by 2;
- quarterly (four times a year), divide the interest rate by 4;
- monthly (twelve times a year), divide the interest rate by 12;
- daily (365 times a year), divide the interest rate by 365.

Simple and Compound Interest

Terms:

1. Principle - the amount of money that is invested
2. Term - how long in years for an investment or loan
3. Compounding period - how often interest is calculated (annually, semi annually, quarterly, monthly, daily)
4. Simple Interest - interest calculated as a percentage of the principle

Simple Interest Formula: $I = Prt$

I - interest

P - principle

r - annual interest rate (decimal form)

t - the term of the investment

Ex. Bill invests \$25000 for 4 years at an interest rate of 3.5% per year.

A. How much interest will Bill have after 4 years?

$$\begin{aligned} I &= Prt \\ &= (25000)(0.035)(4) \\ &= \$3500 \end{aligned}$$

B. How much money will Bill have in 4 years?

$$\begin{aligned} &25000 + 3500 \\ &= \$28500 \end{aligned}$$

Example 1

Gordon wants to invest \$2000.00. His bank offers an investment option that earns simple interest at a rate of 1.75% per year.

- a) If he invests the money for 1 year, how much interest will Gordon earn?
- b) If he invests the money for 2 years, how much interest will Gordon earn?
- c) Based on your answers above, write an equation that can be used to calculate simple interest.

$$\begin{aligned} a) \quad I &= Prt \\ &= (2000)(0.0175)(1) \\ &= \$35 \end{aligned}$$

$$b) \$70 \quad c)$$

Compound Interest - interest that is paid on the principle plus the interest (earn interest on interest)

Compound Interest Formula:

$$A = P \left(1 + \frac{r}{n} \right)^{nt}$$

$$A = P(1 + r/n)^{nt}$$

A = final value of the investment

P = principle

r = interest rate expressed as a decimal

n = the number of compounding periods in a year

t = the term of the investment in years

Example 1:

Natasha invests \$25000 for 4 years at a rate of 3.5% compounded semi annually.

A. How much money will Natasha have in 4 years?

$$\begin{aligned} A &= P \left(1 + \frac{r}{n} \right)^{nt} \\ &= 25000 \left(1 + \frac{0.035}{2} \right)^{2 \cdot 4} \\ &= 25000 (1.0175)^8 \\ &= 25000 (1.149) = \$28722.45 \end{aligned}$$

B. How much interest will Natasha have earned in 4 years?

$$\begin{aligned} &28722.45 - 25000 \\ &= \$3722.45 \end{aligned}$$

2. Amy invests \$5000 at 2% interest compounded quarterly for 6 years. How much money will Amy have at the end of 6 years and how much of it will be interest?

Pg. 112 #1 and #6